

beds of copper slates. In volume VIII of the Journal of the Dublin Geological Society, page 86, the gray copper ores, which characterize the red slates at the base of the so-called Carboniferous formation in the North and South of Ireland, are said to lie two thousand six hundred and forty feet below the base of the carboniferous limestone. Whether these rocks be Devonian or Carboniferous has been discussed by Mr. Jukes and Dr. Griffith, and decided by the latter, with the concurrence of Prof. Haughton and other British geologists, in favor of their classification as Carboniferous, on the ground of their containing fossils of that type.

It is remarkable that, along the base of the Alleghany Mountains, where our Pennsylvanian sub-carboniferous formations X and XI, so immensely thick at Pottsville, have thinned away to a few hundred feet,—and also in northeastern Pennsylvania, where the three formations IX, X, XI, are all together reduced to a thickness of not much more than two thousand feet, bringing the undeniably Devonian formation VIII, up to within that distance of the coal, there occurs a copper-ore slate horizon a few feet thick, which will exactly correspond in position to the copper-slates of Ireland.

The Society was then adjourned.

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*Stated Meeting, May 18, 1860.*

Present, fifteen members.

Dr. Wood, President, in the Chair.

The following donations for the Library were announced :—

Annales des Mines, Vol. XV, 3d part, and Vol. XVI, 4th pt. of 1859.

Intorno alla influenza dell 'Elettrico nelle formazione della Granuola,

&c. An 8vo. pamphlet memoir of Prof. Zantedeschi.

American Journal of Science for May, 1860.

Journal of the Franklin Institute for May, 1860.

Centennial Anniversary of the Foundation of the Germantown Academy, 1860. 8vo. pamphlet, 58 pages. Philadelphia.

The Motion of Fluids and Solids relative to the Earth's Surface; comprising Applications to the Winds and the Currents of the Ocean. By W. Ferrel. 8vo. pamphlet, 72 pages. New York. Taken from the 1st and 2d vol. of the Mathematical Monthly.

Dr. Franklin Bache announced the decease of Judge Thomas Sergeant, a member of the Society, who died on the 5th of May, in the 79th year of his age; and, on motion, E. Spencer Miller, Esq., was appointed to prepare an obituary notice of the deceased.

Mr. Dubois offered, for the inspection of the Society, a specimen of the Washoe ore, which is now attracting so much attention; with a report of its content in silver and gold, as just ascertained by Mr. Eckfeldt.

The ore is a galena, interspersed with pyrites and siliceous matter, and, in general appearance, altogether different from the forms of galena which we are accustomed to see. Nor would its physical characters lead any one to suspect that it could be so rich in the precious metals. The specimen is from the Comstock vein; and it may be stated (although probably known to the members present) that the centre of these mining operations is about three hundred and thirty miles in a northeasterly direction from San Francisco, within the line of the territory of Utah, in a country destitute of vegetation, and very scantily supplied with water.

From a careful assay, the specimen yields to the pound avoirdupois, *silver* to the amount of \$2 35, and *gold* to the amount of 26 cents; altogether \$2 61 per pound, or, in the usual language of valuation, five thousand two hundred and twenty dollars to the ton. A considerable quantity of this silver has already been sent to the Mint for coinage.

Dr. Wood, the President of the Society, delivered, in conformity with the laws of the Society, the following discourse:—

Among the regulations of the Society is one directing that “the President shall, at some time within the year, deliver to the Society a discourse on some literary or scientific subject, accompanied by such suggestions with regard to the affairs of the Society as he shall judge proper.”

In the novelty of my position last year, I overlooked the exact purport of this law; and I must now offer an apology for the apparent neglect. My object in addressing you, on this occasion, is to fulfil the duty for the present year.

Two things are required by the regulation; one, a discourse on some literary or scientific subject; the other, suggestions on the affairs of the Society. I shall follow the order here laid down. As the length of the communication is left to the discretion of the President, I shall study to make it brief; so that, if it have no other merit, it may at least lay claim to that of wasting but little of your time and attention.

1. There is a point in philosophy which, I think, deserves more consideration than it ordinarily receives: I allude to the evil of too hasty generalization; of leaping to general conclusions inconsiderately from one or a few experiments or observations. This habit has, in my opinion, more than any other one cause, since the general acceptance of the inductive system of philosophy, contributed to the disturbance of admitted truth, and to the introduction of crude and unsound hypotheses, incapable of standing the test of time, yet productive, while they lasted, of no little practical mischief. I will cite a few examples.

A fact in geology is observed which, at first sight, seems to be in conflict with the Mosaic account of creation; and the inference is hastily drawn that we must surrender our faith in Scripture. Further observation reconciles the seeming discrepancies; but, in the meantime, much evil has been done by unnecessarily disturbing settled modes of thought, and, to some extent, even the existing relations of society.

Under certain experimental arrangements, living organized beings have been apparently produced out of inorganic matter, through the influence of electricity; and the conclusion is inconsiderately arrived at, that the general opinion of science as to the necessary propagation of vegetables and animals from pre-existing germs is unsound. Men are thrown into confusion as to their own origin and responsibilities, which interferes materially with their mental health, if it produce no more serious consequences. Subsequent observation shows that all this disturbance is baseless, by proving the experiment not to have been conducted with due care.

Under what have been called Mesmeric influences, which I believe to be nothing more nor less than means of producing a certain degree of irregular mental action, a curious morbid condition of the system

sometimes takes place, accompanied with unusual and seemingly wonderful phenomena; and many minds, not content with the simple facts observed, have pushed them into absurdities of an exciting character, which, in their practical operation, have led to great evil, the corruption of morals, the peopling of Insane Asylums, and sometimes even to suicide. A closer scrutiny limits the observed wonders within the ordinary recognized course of nature; and a better philosophical habit of thought would have obviated all the mischief.

It was found, upon feeding dogs exclusively on gelatin, that life could not be supported by this principle; and the inference was drawn that gelatin is not nutritious, and that all our notions relative to the nutritive properties of calf's-foot jelly, and the usefulness of soup societies, were based upon a great error of fact. Further experiments have shown that there is scarcely a single proximate organic principle which is capable of maintaining life, when used exclusively as food; and that it is by the combination of such principles that nutrition is effected. The same remark applies to all those hasty conclusions, which, from the result of one or a few experiments, would exclude from the category of nutritive food, many other substances which have always formed a part of the habitual diet of man.

It is well known that many chemists, founding their opinions upon similar partial observations, maintain that starch and other analogous substances do not nourish the system, but are useful simply by generating heat, through their oxidation or combustion in the body. The necessary conclusion is, that all physicians have labored under an egregious error, when they have used starch in the form of barley-water, rice-water, arrow-root, tapioca, sago, &c., for the support of the sick and feeble, and must surrender the experience of their professional lives and that of ages before them, to these presumed results of scientific induction. But they who reason thus do not sufficiently consider that, in certain hot climates, where the habitual temperature is often above that of the human body, and where the great struggle is to keep cool enough, millions upon millions of people live mainly on rice or sago, the former of which consists chiefly of starch, and the latter is pure starch. It is inconceivable that the prominent article of diet of such numbers, persons too in good health, and often of great powers of enduring fatigue, should consist of a substance having no nutritive power, and fitted only for generating animal heat, which, under the circumstances, is not needed, and is, indeed, often in excess.

These are a few of the almost numberless instances that might be adduced, illustrative of an habitual departure from sound principles of induction in the search after truth ; but they are sufficient to show the great evil of this error, not only in relation to opinion, but in its effects upon the well-being of mankind.

We are peculiarly prone to it in this country, perhaps in consequence of the habit we have acquired, mentally as well as physically, of hastening onward impatiently to our ends, and, consequently, of recklessly overleaping or pushing aside considerations, which are nevertheless, in general, essential to a safe and satisfactory issue. It is, therefore, desirable to raise a conservative voice against this over-eagerness, and strive as much as may be to restrain it within safe limits.

There are three prominent modes in which partial or insufficient experiment or observation may lead into error.

In the first place, the fact, though in itself true, may not have been sufficiently studied in its various relations, or sufficiently compared with other known facts, which might invalidate the conclusions, hastily drawn from it when viewed isolatedly. Of this we have an example in the inference already referred to, as to the non-nutritive and heat-generating qualities of starch, employed as an article of diet; the attention of the observer having been confined to the results of a few partial experiments, and quite turned away from that grand experiment in the course of constant performance by millions of our race.

Secondly, the seeming fact may prove, on close investigation, not to be a fact at all, but a misunderstood result of inaccurate experiment; as in the production of organized beings through electric influence, out of inorganic matter; the truth being that sufficient care had not been taken to exclude living germs from the field of experiment.

Thirdly, the observed fact may lead to erroneous conclusions from want of attention to that general principle in nature, through which all objects of human thought or notice, of whatever kind, which may be associated together by any relation whatever, have a tendency to an irregular instead of equable distribution, clustering more or less at one time or place, and deficient in another; so that, when objects are diffused with perfect equability, they are known at once, as a general rule, to owe this condition to art. An ignorance or forgetfulness of this great principle has been the source of innumerable fallacies, often highly injurious in their influence. Such fallacies are

especially abundant in the practice of medicine, and are among the strongest supports of all kinds of quackery. I will adduce a single example. Scarlet fever may be a very mild and harmless, or a terribly malignant disease. It often happens, without any discoverable direct cause, that the milder cases cluster; great numbers occurring successively or simultaneously under the notice of a particular practitioner, perhaps without the presence of a single dangerous case among them. No matter what may be the remedy employed, whether good or good for nothing, they all terminate favorably. They would do so, if left entirely to themselves. Suppose, under these circumstances, the practitioner be an ignorant quack; he will obviously get the credit with the community, ignorant of the principle to which we are now referring, of possessing remarkable skill in the treatment of scarlet fever; and he himself, if equally ignorant, will acquire great confidence in the remedy he may have employed. The evil is that, in consequence of this confidence, born of an error in practical philosophy, the quack and his remedy are subsequently relied on in cases of a dangerous character, and requiring great skill; and it is easy to understand how much mischief may ensue.

A glance at the subject I have thus introduced to the notice of the Society, is sufficient to show its great extent and importance. A volume might easily be filled with illustration and commentary. But I content myself with the slight sketch given, fearing that even this may have been tedious to those, quite as conversant as myself with the matters referred to.

2. It remains, in order to fulfil my whole duty on this occasion, that I should make such suggestions as occur to me, with regard to the affairs of the Society.

Under this head I have little to say. In looking over the Transactions of the past year, and comparing them with those of preceding years, I find good reason for encouragement. Should an equal advance be maintained in the future, it will not be long before the Society will be able to boast, that it is doing all that can be reasonably expected of it. In the Proceedings, too, it has by no means been idle. The laws have been revised, modified, and newly printed; some effete regulations having been abolished, and new ones introduced, which it is hoped may work advantageously for the interests of science. Complete catalogues of members, with information as to the period of election and decease, residence, &c., have been prepared, and printed in a style conformable with that of the laws and regulations.

For the future I have only to suggest, a livelier zeal on the part of individual members in general; an encouraging voice from the older to the younger and more enterprising; an increase of our working men by the adoption into the Society of as many as show a strong disposition and ability to labor effectually in any one of the great departments of learning and science; and, lastly, the offering of pecuniary aid, in limited measure, to meritorious investigation, when such aid may be necessary, and can be advantageously applied. Another object worthy of attention, which should, indeed, never be lost from view, is the providing of fire-proof accommodation, whether in this or another building, for our invaluable library.

Lastly, I would refer briefly to a matter which concerns myself as your presiding officer. At the stated meeting, on the 16th of December last, upon the motion of the Chairman of the Committee on the sale of the Hall, a resolution was adopted requesting the President to prepare, and cause to be presented to Congress, a memorial in relation to the Hall, requesting the passage of a law to carry into effect the agreement for its purchase, made by the government. In compliance with this resolution, and in conjunction with the Chairman of the Committee referred to, I have prepared memorials to the two houses of Congress; but it has been considered most prudent, under present circumstances, to postpone their presentation; as there is reason to hope that steps may ere long be taken, which may render any measure of this kind unnecessary.

Most of the Society are aware that I have in contemplation a voyage to Europe, and that I may not meet them again for a year or more. Indeed, I have to thank you for your kindness in supplying me with a document, which, by recognizing me as your accredited representative abroad, will, I hope, in a considerable degree, facilitate the attainment of some of the ends for which I visit Europe. In taking my leave of you, gentlemen, I wish to assure you, that I shall continue to have the interests of the Society at heart, and, should opportunities offer during my absence, shall most gladly avail myself of them for the furtherance of these interests.

*May 18th, 1860.*

Judge Carleton made a communication on the subject of Free Agency, or Liberty and Necessity; referring to the opinions of Locke, Edwards, Sir William Hamilton, and other metaphysicians, and expressing his conviction of the entire simplicity and intelligibility of this subject of so many con-

troversies, seeing that *all* human science must consist of facts, or assemblages of facts, perceived by means of the senses; and that, therefore, metaphysics must rest as much on perceptible facts as does any of the so-called natural sciences. He promised to pursue the subject at a future meeting.

The minutes of the last meeting of the Board of Officers and Council were read, and, in accordance with a recommendation therein, the Dublin Geological Society, the London Philological Society, and the Liège Academy of Sciences, were ordered to be entered on the list of Corresponding Societies, and a copy of the New Series of the Transactions to be given to the first-named.

Pending nomination No. 397, and new nominations, from 398 to No. 415, were read.

A bill was presented for the painting of a portrait of Dr. N. Chapman by Waugh, after Sully, amounting to \$125, and was ordered to be paid,

And the Society adjourned.

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*Stated Meeting, June 15, 1860.*

Present, seven members.

Judge SHARSWOOD, Vice-President, in the Chair.

Letters, announcing donations to the Library, were read from the Academy at Vienna, dated July 7 and December 17; the Academy at Stockholm, dated November 25; and the Academy at Amsterdam, dated November 30, 1859.

Letters, acknowledging the receipt of donations from this Society, were read from the London Linnean Society, dated June 1, 1859; from the Historical Society of Pennsylvania, dated Philadelphia, May 29; from the Royal Library at Berlin, dated February 29; from the Natural History Society at Bonn, dated February 1; from the Imperial Academy at Vienna, dated February 24; and from Prof. Von Leonhard, of Heidelberg, dated February 26, 1860.